

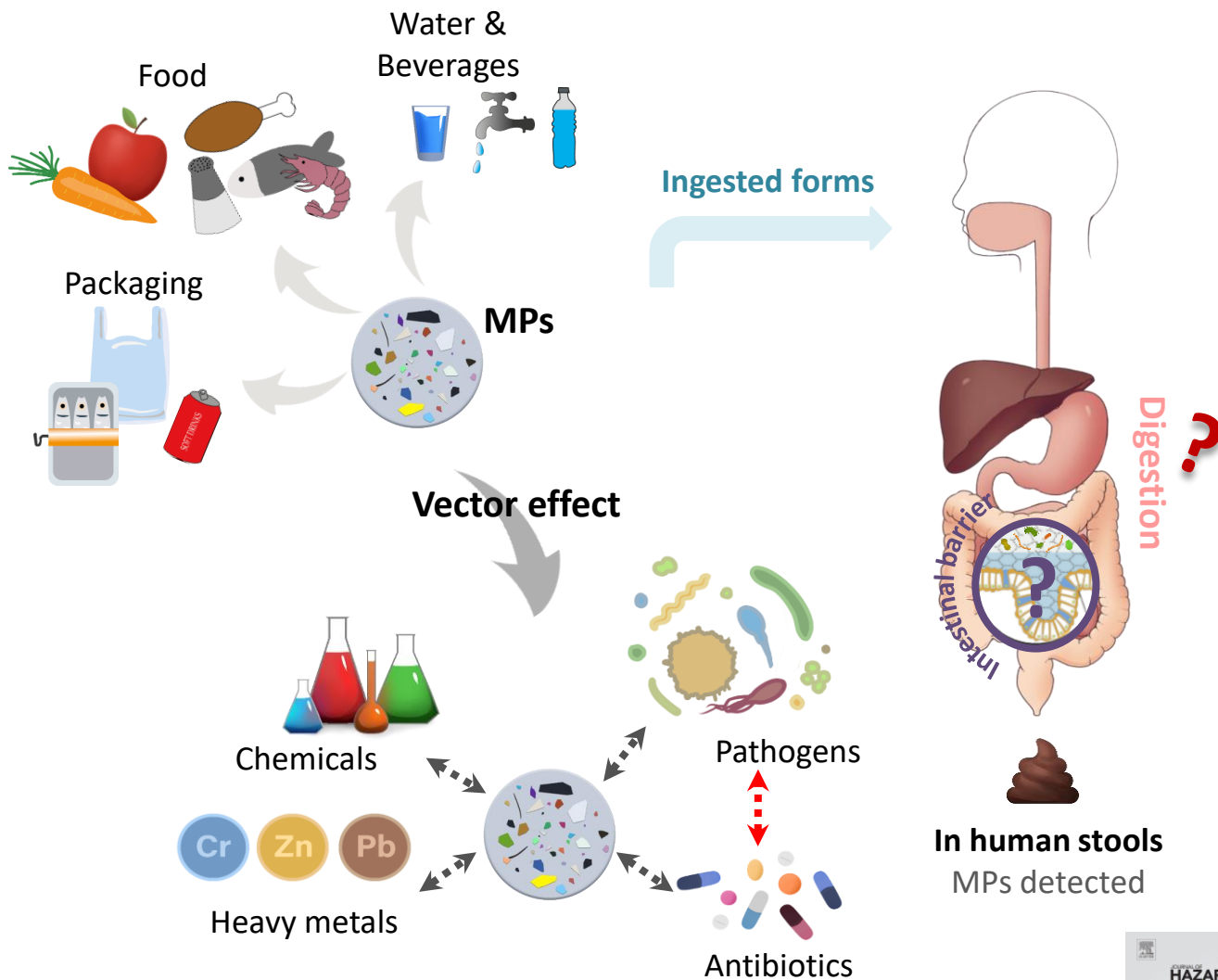
Microplastics in our diet:
Complementary *in vitro* gut and epithelium models to
understand their fate in the human digestive tract

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Microplastics (MPs) in the human digestive tract

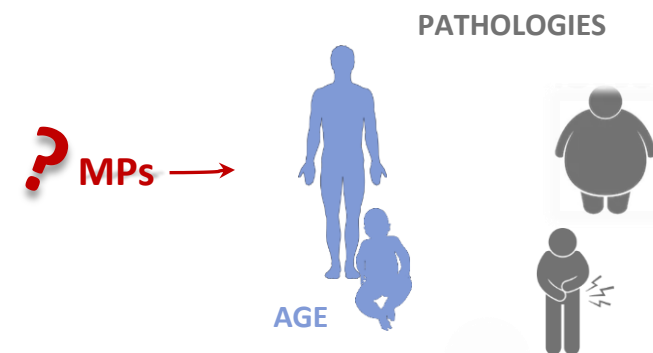
MPs and human gut



Physico-chemical environment of digestion

Gut microbiota

Intestinal epithelium & mucus



Microplastics impact on human gut ?



Microplastics in the human digestive environment: A focus on the potential and challenges facing *in vitro* gut model development

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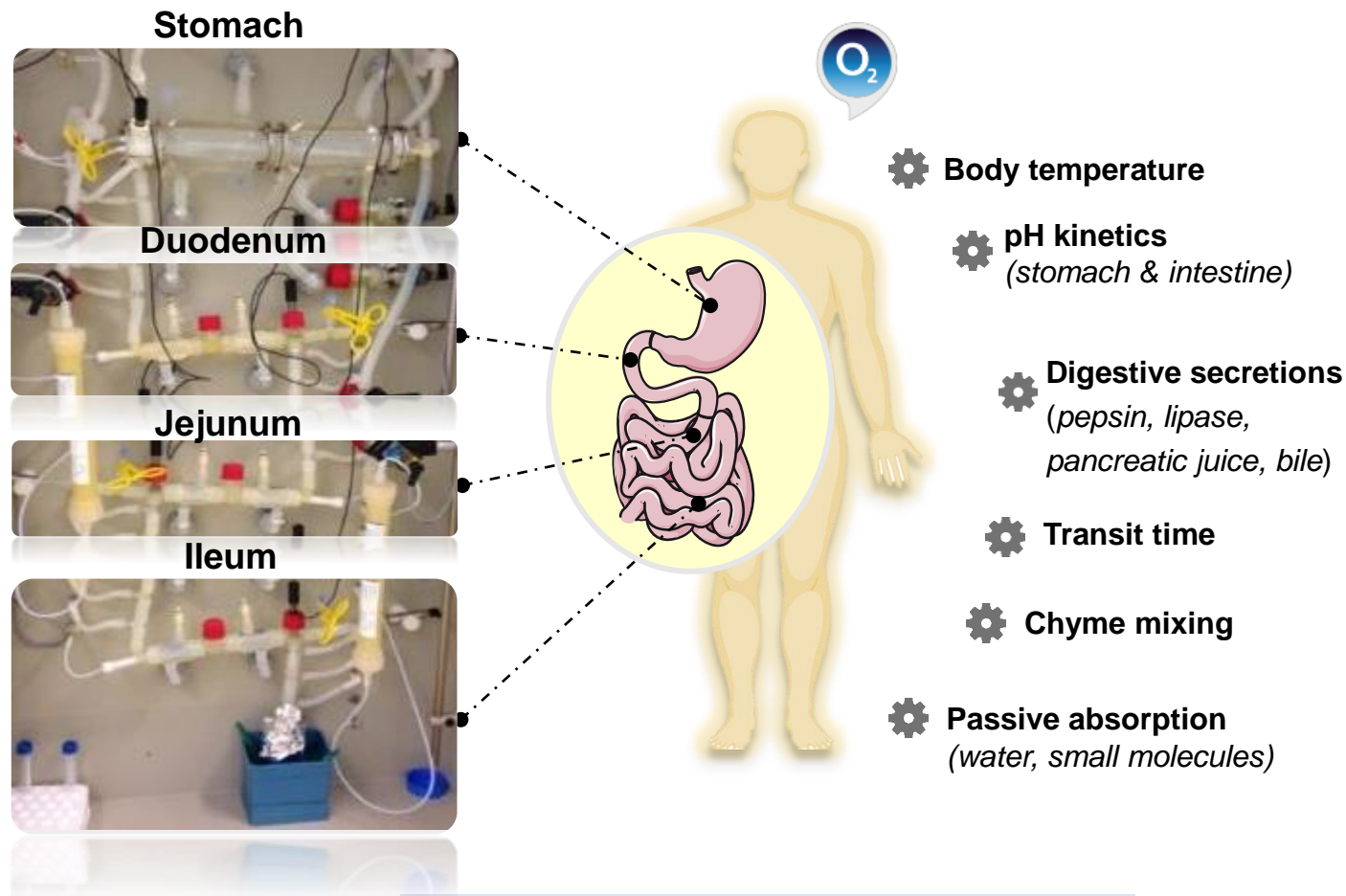
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Fate of MPs in the human upper digestive tract

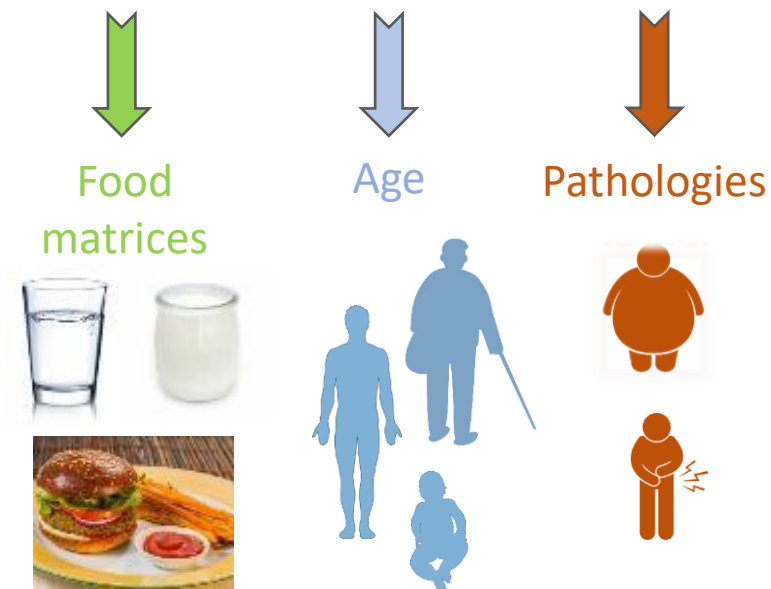
Human simulated conditions



Physico-chemical modifications & degradation of MPs



TIM-1 (TNO gastro-intestinal Model)



MPs as vectors of chemical & microbial contaminants

- ✓ Survival & virulence of pathogens
- ✓ Desorption kinetics of pollutants

Fate of MPs in the human lower digestive tract

Human simulated conditions

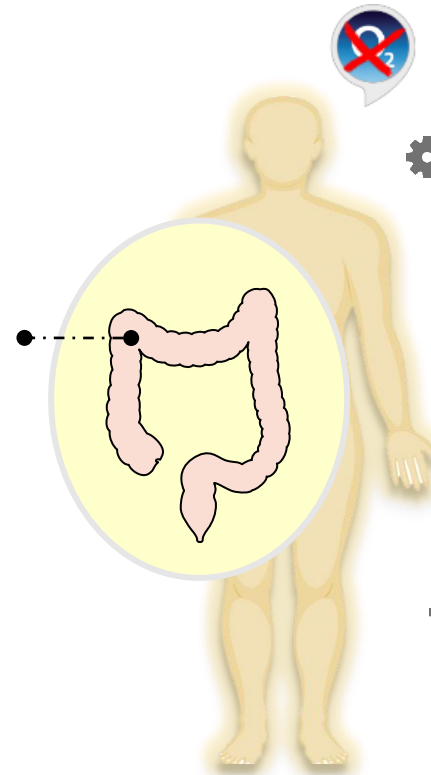


Impact of MPs on gut microbiota structure/activity & MP degradation/metabolisation by microbiota

Luminal compartment



Mucosal compartment



⚙️ Body temperature

⚙️ pH

⚙️ Transit time

⚙️ Composition of ileal effluents

⚙️ Anaerobiosis

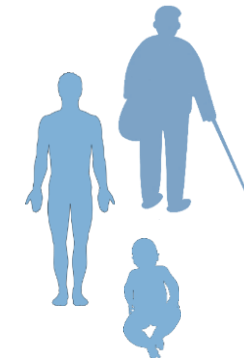
⚙️ Lumen & mucus-associated gut microbiota



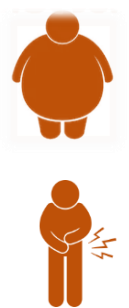
Various diets



Age



Pathologies

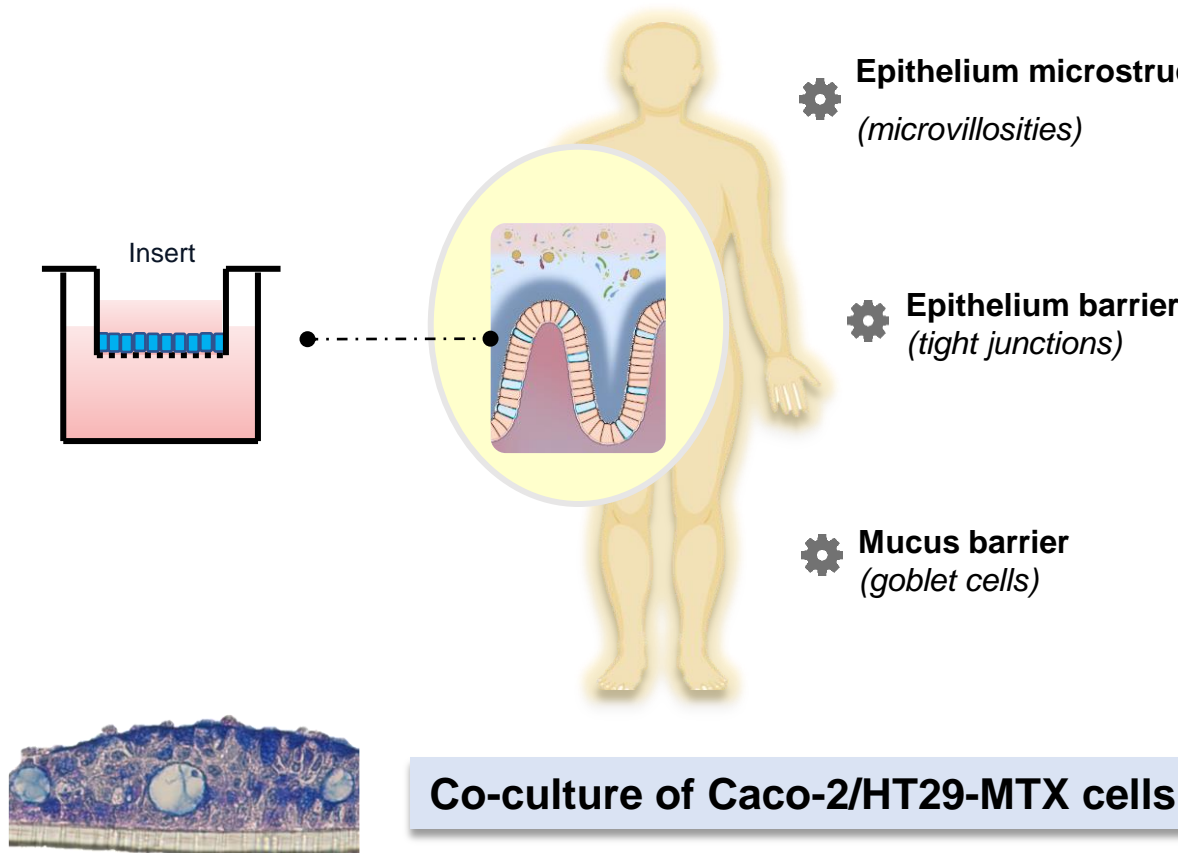


MPs as vectors of chemical & microbial contaminants

- ✓ *Survival & virulence of pathogens*
- ✓ *Desorption kinetics of pollutants*
- ✓ *Antibiotics & gut microbiota*

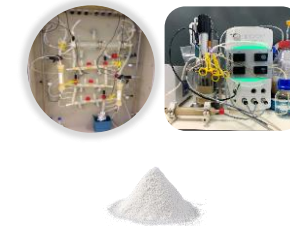
Impact of MPs on the intestinal barrier

Human cell lines in co-culture



Interactions MPs ~ epithelium ~ mucus
Cytotoxicity, permeability, inflammation,
uptake/translocation

Impact of
digestion



Undigested vs
digested MPs
(TIM-1, ARCOL)

MPs & adsorbed
contaminants

